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ADDITIONS TO OUR KNOWLEDGE OF *UNIONICOLA*
ACULEATA (KOENIKE)*

BY

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The material of *Unionicola aculeata* (Koenike) on which this paper is based was secured from one of many specimens of *Lampsilis luteola* Lamarck, from North Judson, Indiana. The host was determined by Mr. Frank C. Baker, Custodian of the Natural History Museum of the University of Illinois. The general organization of the mite conforms to the type species described by Koenike (1890), but certain interesting variations and certain structural yet inadequately described deserve to be made a matter of record.

U. aculeata was originally described from Germany by Koenike, as similar in many respects to *U. crassipes* (Müll.) and in others to *U. figuralis* (Koch). It differs from the former in the exact structure of the palpus, in the number and distribution of the genital acetabula, and in the structure of the chitinous ovipositor. Wolcott (1899) describes this species from Michigan. The mite recorded by Soar (1899) as *Atax taverneri* has also proved to be *U. aculeata*. Piersig (1901) has made two subspecies of *U. aculeata*, separating the American form, *U. aculeata sayi*, from the European form, *U. aculeata aculeata*, on the basis of the number of the tarsal claws, comparative lengths of the leg segments, exact relations of the parts of the genital field, and a slight size difference.

The specimens collected by the writer conform to those described by Wolcott in most respects. In size they belong to Piersig's smaller group, since the female measures about 680 μ long and the male measures about 640 μ long.

Wolcott's specimens have a terminal segment to the female palpus which is somewhat attenuate distad, ending in four small claws. In the writer's material the palpus has a more distinctly thickened terminal joint, with two finger-like claws and two thumb-like claws in the female and with two finger-like claws and only one thumb-like claw in the male. The penultimate joint of the palpus in Wolcott's material has a needle spine which is not present in the North Judson material. In the female of this material the basal segment is in each case the thickest of the six.

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The joints are progressively narrower and longer from base to tip. In the female there are three conspicuous spurs on the ventral side of the basal joint, and two undivided sickle-shaped claws at the end of each tarsus. Long needle spines are prominent on segments two to four. Soar (1899) figures the claws of the first leg as cleft, a feature which Wolcott (1899) describes for both *U. aculeata* and *U. crassipes*, while those of the writer's material are entire as in legs two to four.

Perhaps the most interesting feature of the entire body structure of *U. aculeata* is the heteromorphic fourth leg of the male. On this appendage both the joints and spines are curiously modified so that they present a striking ornate appearance (fig. 5). The tarsus is a long attenuate flat plate as in the female, with two undivided terminal claws and two accessory spines. The main shaft of the tarsus is free from spines. The tibia is short and thick with seven needle spines, two large heavy spines and one small spine. The third segment has three large and three small blunt spines, in two parallel lines at the outer edge of the joint. The fourth and fifth joints are both shorter than joint three altho not as short as the tibia. They are both supplied with several short bristles. The basal joint is irregularly sculptured and bears four spines.

The genital field of the female resembles closely that described by Wolcott, altho the cleft between the two plates is not distinguishable as a separate structure and no posterior papillae are found in the writer's material. The external male genital organs (fig. 3) are very complicated, consisting of an ornate sculpture of chitin, to which prominent muscle bands are attached.

A thoro study of the new material and comparison with that described by Koenike, Wolcott, and Soar, shows the wide range of variability within the species, while at the same time it discredits Piersig's separation of the species into two subspecies. It seems much more desirable to regard the species simply as highly variable rather than to maintain a subdivision, since the lesser similarities and differences grade into each other almost imperceptibly in various specimens.

Unionicola aculeata has been credited by some as a parasite of the Unionidae and by others as free-swimming. Koenike (1915) has shown that it is free-swimming during a considerable part of its life and seeks the mussel at times of metamorphosis and propagation. This fixes our knowledge of the periodicity of the parasitism, but leaves us in the dark with regard to the degree of parasitism. The mites described in this

paper were found embedded in the subdermal connective tissue of the mantle and foot of the mussel (fig. 6). Their position was related to no definite axis of the host. Around it was a thin tissue cyst. In no case were they found to have injured the host outside of the cyst. Thus, altho an endoparasite, the evidence shows it to be only a temporary lodger.

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EXPLANATION OF PLATE XII

Fig. 1. Dorsal view of female palpus, X 226; fig. 2, ventral view of first leg of female, X 140; fig. 3, male genital organs, X 140; fig. 4, female, ventral view, X 100; fig. 5, heteromorphic third leg of male, X 140; fig. 6, section thru outer portion of foot of *Lampsilis luteola*, with encysted *Unionicola aculeata*, X 140.

